Internet traffic has greatly increased the amount of IOF required to provide acceptable levels of service to all end users (regardless of whether PRI or analog lines are used). For example, the number of interoffice trunks in service for the switches in our traffic study increased 44% from June 1995 to June 1996 (a total of 16,585 trunks). Traditional growth expectations would have been in the range of 9% (3,397 trunks). The approximate capital cost of IOF is $1,350 per circuit. Thus an "above normal" investment of $17.8 million was required for the additional 13,188 IOF trunks for these 9 central offices.

Looking at recent experience in actual central offices helps to validate the argument that Internet traffic loads are adding to the cost of maintaining acceptable levels of telephone service for the public as a whole.

A 5ESS Office Located in Northern Virginia Serving a Large ISP

During the second half of 1994, this switch was running slightly above capacity due to higher than projected growth. The dial tone delay (percent of customers receiving delayed dial tone) varied between 0.54% and 0.78%, and the office experienced a busy hour of approximately 2.5 CCS between 15:30 and 16:30 hours. Network Administration rarely received trouble reports from field technicians and just an occasional call from the repair bureau.

Customer complaints about poor service began to increase substantially in February/March 1995. Trouble reports from field technicians increased from zero to in excess of 25 per month and a

number of customer appeal cases were received. The situation had deteriorated to the point that one maintenance technician had to be assigned specifically to handle trouble reports. Investigations revealed that the ISP served out of that office was utilizing all available timeslots in various line equipment. This blocked access to the switch by basic residential and business customers. In February of 1995, dial tone delay had increased to 2.22%, as the ISP's lines in service grew rapidly. These lines were averaging 35.5 CCS at their busy hour, and had begun to shift the office busy hour to much later in the evening.

The decision was made to remedy the situation by dedicating certain central office equipment to the one ISP customer. Implementation of this strategy required the deployment of 6 switching module controllers, 1 digital line trunk unit, and 1 integrated digital carrier unit. This solution avoided blocking of normal residential and business calls. Even though effective, this solution has proven to be extremely expensive. The cost for switching equipment alone was $1.9M, and was five times the normal cost per line for office equipment. Labor expenses for rearranging lines were in excess of $100,000. By contrast, the revenue from the ISP for the lines affected was approximately $20,000 per month.

A 1AESS Office Located in Northern Virginia Serving An ISP

During the 1994/1995 busy season review this office was running well. The office overflow was averaging between 95.50 and 98.00 index each month. Busy hour CCS was averaging 3.21 during the busy season which was consistent with historical data for this office.

In Late December, 1995, the Network Administration Center received a trouble report for slow dial tone from the ISP. Subsequently, it was discovered that 50% of the ISPs lines were assigned to 2 line units which had been recently installed. These lines were averaging around 35 CCS during the evening hours, and 17 CCS over a 24 hour period. The office overflow increased from 14,000 in October 1995 to 73,600 in March 1996. The overall impact to the switch was to increase the busy hour CCS to 3.7, which represents a 15% increase in total switch demand.

Line and equipment transfers were performed to spread the ISP's access lines across multiple line units. All additional lines for the ISP have to be manually assigned to prevent overload conditions. An additional 312 interoffice trunks were also added to alleviate congestion in this part of the network.

Another 1AESS Office Located in Northern Virginia Serving An ISP

This office was traditionally one of the most trouble-free wire centers in Northern Virginia. The CCS per network access line was 2.56, and there were very few switch related trouble reports. The Network Switching Administration Group noticed a gradual increase in the "incoming matching loss" failures (calls incoming via trunks which are blocked in the switch) for the office in the fourth quarter 1995. Subsequently, "office overflow" failures (which is the sum of incoming and outgoing matching loss, as well as trunk overflow) increased from 2,445 to 21,000. This increase in failures was due to a substantial increase in call attempts and duration time

incoming to the switch destined for the ISP multiline hunt group. The net effect of this activity was an increase in the average busy hour CCS to 3.11 and a shift in the busy hour to the early evening.

The fix again involved spreading lines over multiple line switches, which required transfer of many residential and business customers to provide additional switching capacity for the ISP's lines. The labor and capital expense to accommodate the ISP's traffic are in effect allocated across all other customers.

A 5ESS Remote Located In Maryland Serving An ISP

Remote offices such as this one are hosted from another office located nearby. During the 1994 busy season review, this remote office was equipped with 5 line units and 2050 working lines. The capacity was sufficient to handle normal growth expectations. The dial tone delay was 0.09%, office overflow was 0.18% and the busy hour was 15:30 - 16:30.

In February 1995 numerous customer complaints associated with slow dial tone were experienced. An investigation revealed the cause of the problem was traffic destined to the ISP served out of this office. Heavy utilization of these access lines had driven CCS up to 3.18, as well as increasing dial tone delay to 0.40% and office overflow to 1.09% during the normal busy hour of 15:30 - 16:30. ISP traffic had shifted the busy hour to 20:00 - 21:00, with CCS

exceeding 4.0, with a dial tone delay of 14.3% and office overflow which approached 19%. Switch capacity was exhausted.

The conclusion was reached that remote switching centers could not be equipped to support the demand generated by an ISP. Therefore the decision was made to rehome the ISPs lines directly to the host switch. Approximately $200,000 in capital was expended to implement this strategy due to the fact that a new digital loop carrier terminal was required in the host office, so that the ISP's lines could be spread across multiple line units, thereby lessening the overall CCS impact to the office.

A Northern Telecom DMS-100 In Maryland Serving An ISP

This wire center contained strictly analog line units with limited spare floor space which did not allow a building addition. As the ISP traffic rapidly increased, it became evident that this office would be unable to support this growing traffic requirement. It was determined that the only feasible solution was to home all growth lines for the ISP to another office via a digital loop carrier system . The cost of this facility was approximately $300K. Since revenues from this ISP are about $15,000 per month, it will take at least 20 months to recover just this one equipment item, not addressing all remaining equipment and labor costs required to serve the customer.

SECTION FOUR - Cost Impacts

Traditional cost models designed for general ratemaking across all customer segments do not have the ability to identify and attribute costs specifically to ISPs. However, information derived from our network engineers can be used to generally illustrate the conclusion that current revenues derived from local services provided to ISPs do not come close to recovering the cost of providing service. Hence a cross subsidization is occurring between users of ISP services and all other users.

The network elements most affected by heavy traffic loads from ISPs are line units, switch modules and interoffice trunking. Per subscriber line served, these units generally result in a capital cost of approximately $245. This assumes the normal traffic load of 3 to 4 CCS. However, as CCS approaches 30, the capital costs for these units approaches $2400 per subscriber line, because of the reduced number of lines they can serve and the increase in interoffice traffic. As shown below, this translates into an approximate monthly cost per subscriber line of $75, compared to the average tariff rate of about $17 per month. Preliminary studies show that the comparable monthly cost per subscriber line for PRI circuits is estimated to be $50.

For illustrative purposes, we have attempted to size this for our entire network as follows. We estimate that during 1996, ISP circuits will average 40,000 throughout our region. (This is estimated based on input from sales organizations, as system databases do not specifically

identify ISP circuits, and ISPs themselves often do not identify themselves as being ISPs. Since ISP circuits are growing very rapidly, the end of year total will significantly exceed the beginning of year total.) Roughly half of the circuits are analog lines (e.g. 1MB) and half are PRI.

The $2400 in capital costs for what in effect are traffic sensitive investments can be converted to a rough monthly cost by utilizing a standard annual cost factor of .37 (source: our network engineering organization). This annual cost factor is a shorthand way to incorporate overheads, maintenance, depreciation, etc. This results in approximately $900 in annual costs, or roughly $75 per month per ISP analog line.

Utilizing the 40,000 average ISP circuit count (roughly 50% analog and 50% PRI) and the estimated monthly cost per circuit ($75 cost per month per analog line and $50 per month per PRI), the total estimated cost of serving ISPs in 1996 is $30 Million. Assuming average revenue from ISPs for these lines was $17 per month per line, total revenues from this segment in 1996 for public switched network service would be $8.2 Million. Thus there is a cross subsidy of approximately $22 Million for 1996. Assuming an annual growth rate of 40% for illustrative purposes, this cross subsidy would grow to approximately $120 Million in five years.

The above calculations are presented to provide current insight into the dimensions of the issues raised in this report, and are based on broad averages across our region. We will continue to fine-tune our understanding of the cost issues and collect data which result in increased accuracy.

SECTION FIVE - ESP Exemption and Incentives for Adopting New Technology

Perhaps the most significant shortcoming of existing service arrangements provided to ISPs is the flat rate per month. For about $17 per month, an ISP can utilize lines from the public switched network that can be literally filled to capacity. Increasingly, ISPs are moving to charge their subscribers flat rate prices as competition within their industry accelerates. Flat rate prices, and the nature of on-line communications has resulted in call characteristics for computer-type "calls" which vary significantly from traditional voice calls. The flat rate price encourages users to connect, and stay connected throughout the day (and evening). Applications such as voice over the Internet can be most effective if the user's Internet connection stays on all the time. In effect, a circuit-switched architecture has been converted to a private line - as a result of the pricing signal we are sending. Neither end users nor ISPs have sufficient incentive to utilize public switched network resources efficiently.

Another consequence of today's pricing signal is to retard the adaptation of more appropriate technologies. Since data transmissions are generally more tolerant of minor delays than voice services, a packet technology is particularly well suited to the transmission of Internet-type communications. Bell Atlantic has introduced a service called Internet Protocol Routing Service (IPRS), which utilizes SMDS to transport calls. In addition to providing more efficient transport of Internet-type calls, this service would assist the circuit-switched network used for voice calls by alleviating congestion at the central offices that serve ISPs. With IPRS, traffic will be

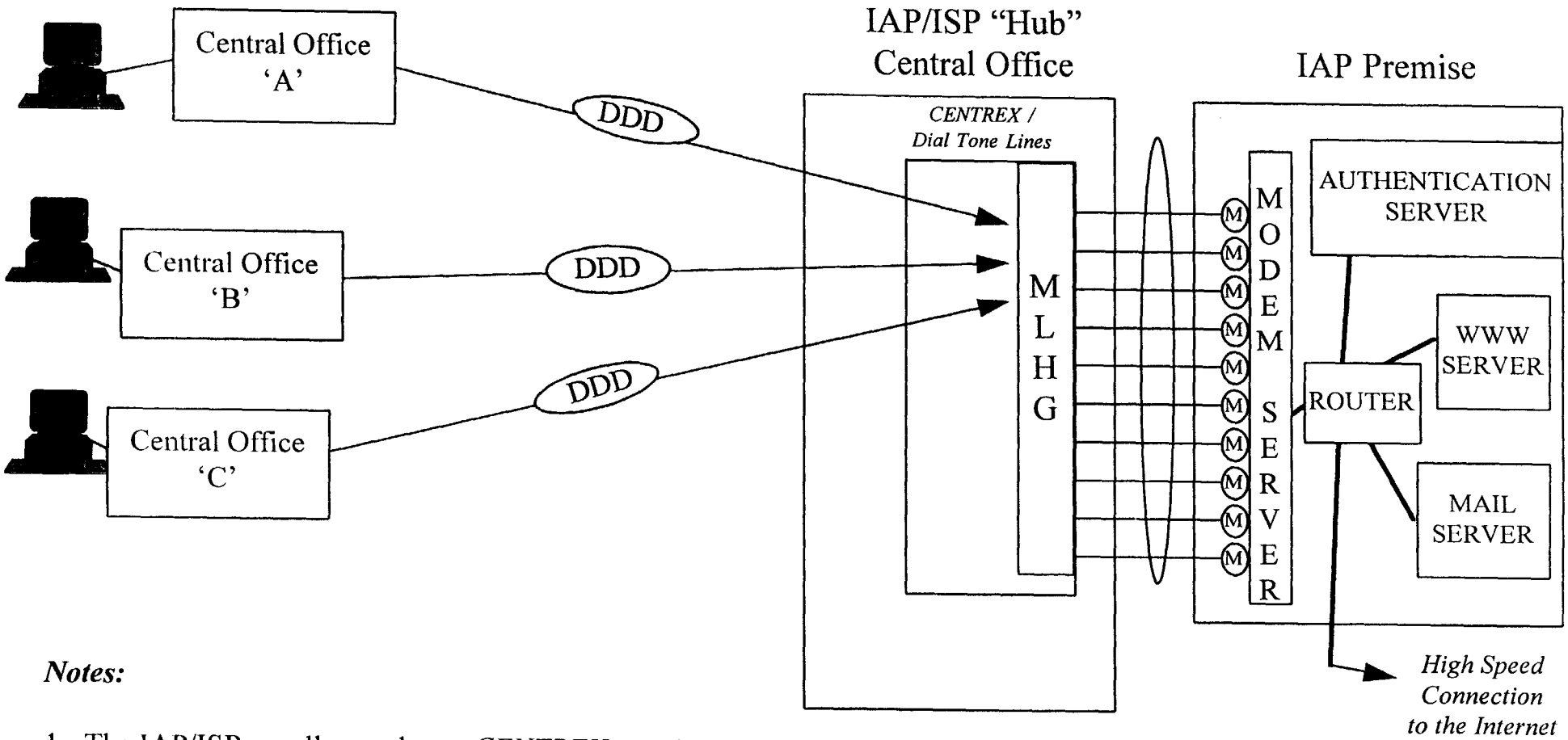
collected at many originating end offices and transported directly to ISP offices. Other technologies are on the drawing board which could both provide better service to end users, and help alleviate congestion on the public switched network.

However, as long as current pricing arrangements are in effect (i.e. the ESP exemption), the time it takes for these technologies to be adopted is artificially lengthened. The ISPs in our traffic study generated on March 13 (the same day selected for the graphs attached to this report) 608 minutes of use per line over the 24 hour period. Based on payment of $17 per month per line, the ISPs pay 56 cents per day, or $.0009 per minute of use. This contrasts with Bell Atlantic's interstate switched access charge of approximately 2 cents per minute. In effect, ISPs are paying 1/22 of the equivalent per minute rate paid by IXCs during a business day. At these levels, ISPs would have little incentive to adopt voluntarily alternative forms of access.

A usage sensitive price (related to the traffic sensitive costs in our local network) is needed to send the appropriate signal to use the public switched telephone network efficiently. However, we recognize that this price must be at a level which does not cause disruption in the industry. As stated at the outset of this report, Bell Atlantic will work with the Commission and industry participants to come up with pricing options that help to moderate existing cross subsidies, and help send the type of economic signal that will aid in allowing the faster adaptation of technologies which will help alleviate growing congestion on the local telephone network, but which will also not lead to undue disruption in the industry.

As an important first step, we applaud the Commission's invitation to provide this information which establishes the dimensions of the problems we are experiencing, and we encourage the Commission to take the next step of requesting broader input. The problems we have experienced thusfar, while severe in our view, have not been recognized by the public at large. Given the rapid, and almost volatile, growth of traffic related to serving ISPs, however, it is not difficult to envision scenarios whereby traffic surges might occur which would overwhelm the ability of local networks to sustain service. Service interruptions of even a temporary length could affect public safety services such as 911 service, with unthinkable consequences. Therefore it is important for the Commission to address quickly the issues raised in this report.

Using the DDD Network to Connect Incoming Callers to an Internet Access Provider ***- - - - - - - - - - - - - - Attachment 1***

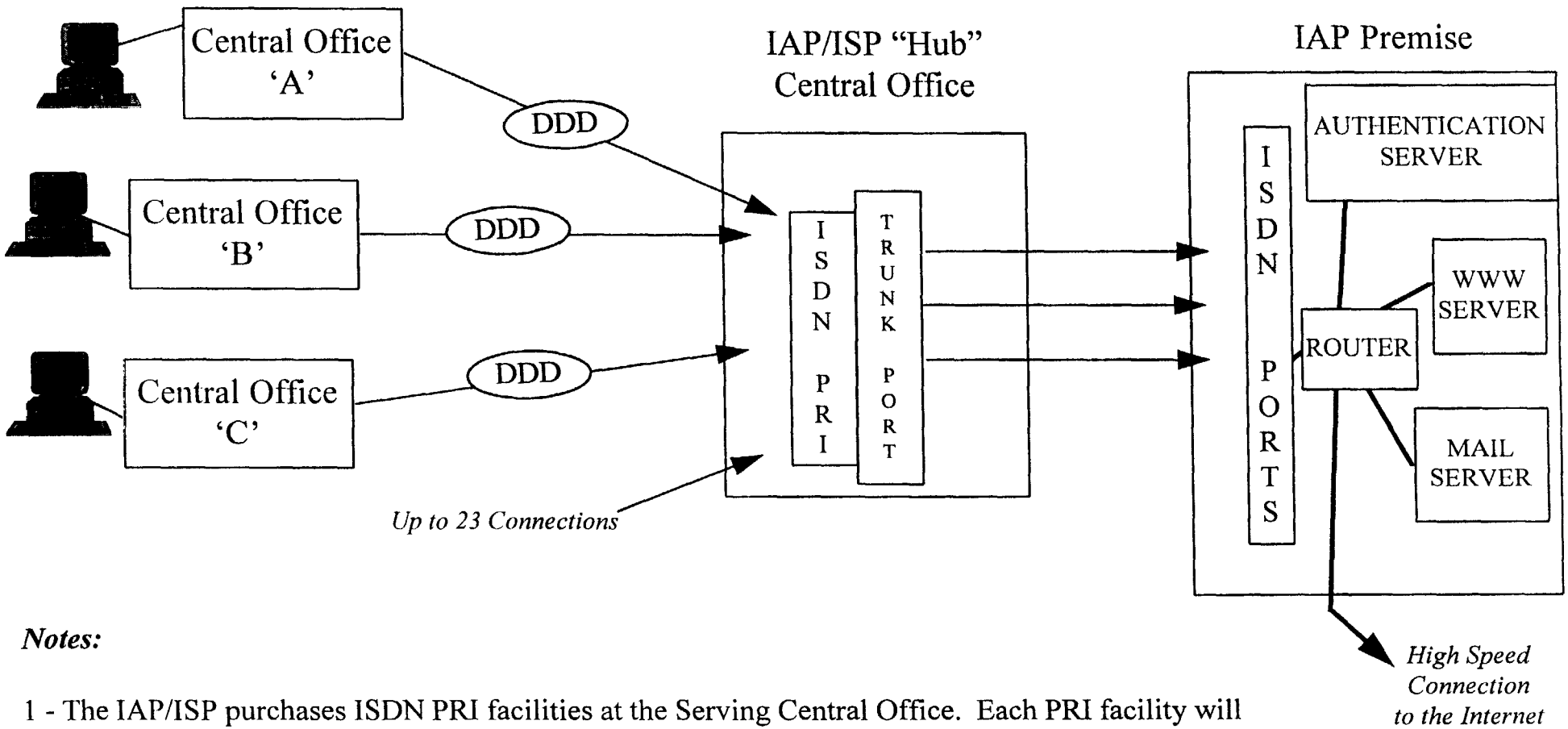


Notes:

1 - The IAP/ISP usually purchases *CENTREX* or Dial Tone Lines at the Serving Central Office, placing all of the modem access lines in a large, single lead number accessible, Multi-Line Hunt group (MLHG). The number of lines in the MLHG is set to provide a predictable level of service during the IAP/ISP's busy hour.

2- The IAP/ISP's customers would pay any applicable network usage charges. Since many customers call over flat rated facilities, most often there are no usage charges involved.

Access to Internet Access Provider via -Attachment 2
ISDN Primary Rate (PRI) Service



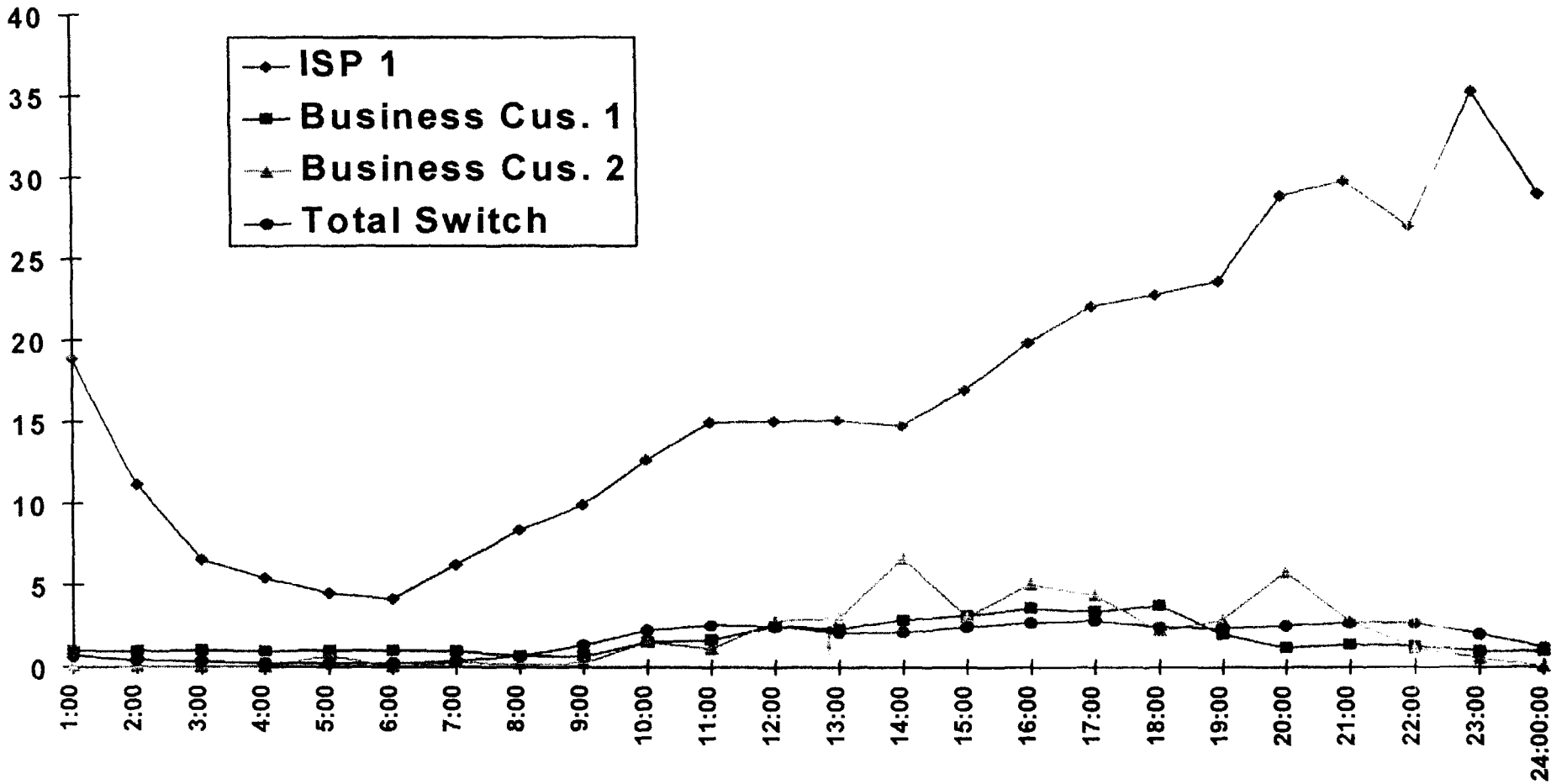
Notes:

1 - The IAP/ISP purchases ISDN PRI facilities at the Serving Central Office. Each PRI facility will support up to 23 simultaneous dial in analog or ISDN Basic Rate Interface connections with the 24th channel providing signaling. Additional PRIs used in a hunt group can support 24 simultaneous calls each.

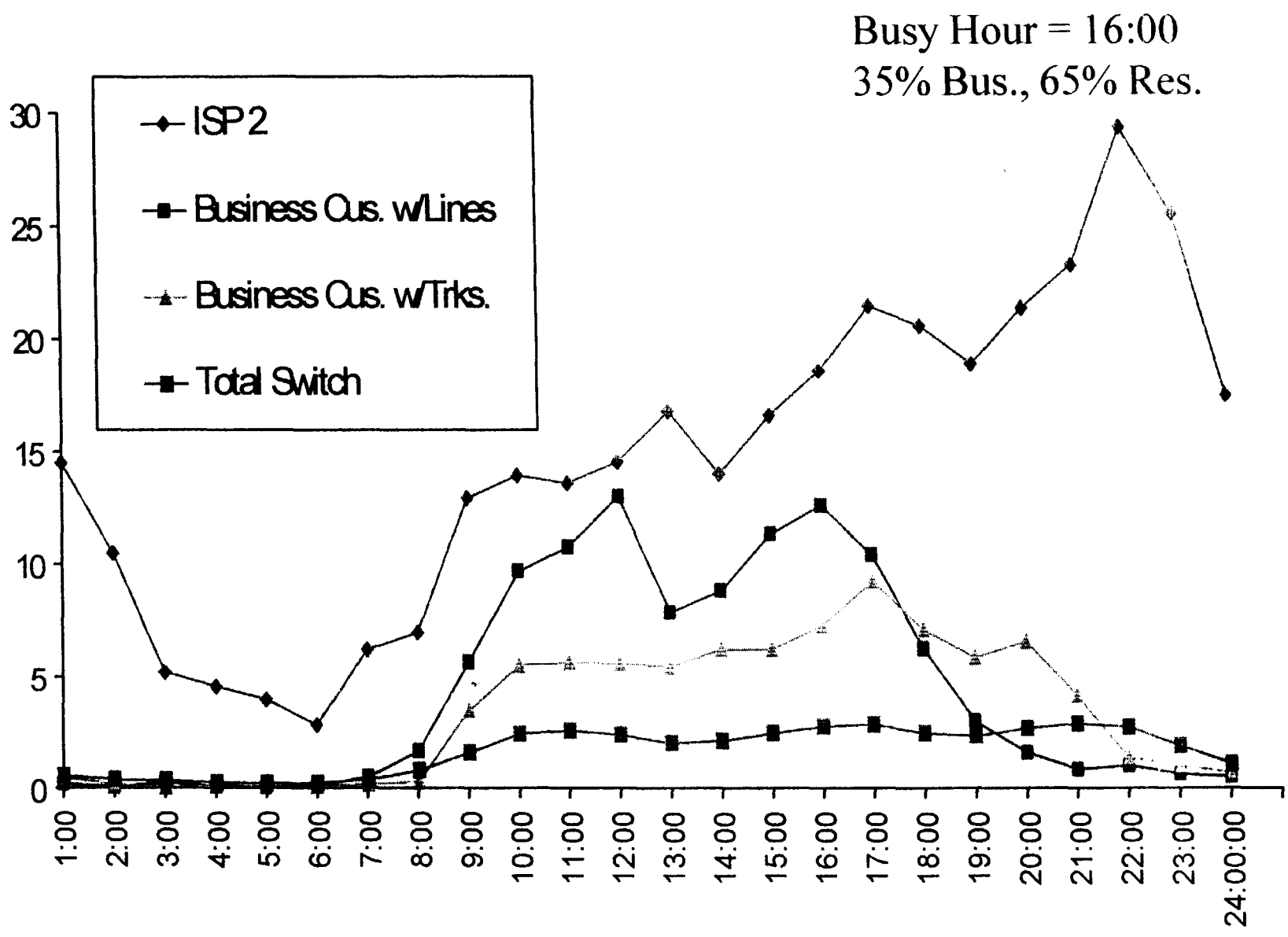
2 - The IAP/ISP's customers would pay any applicable network usage charges. Since many customers call over flat rated facilities, most often there are no usage charges involved.

Office A 3-13-96

Busy Hour = 16:00
33% Bus., 67% Res.

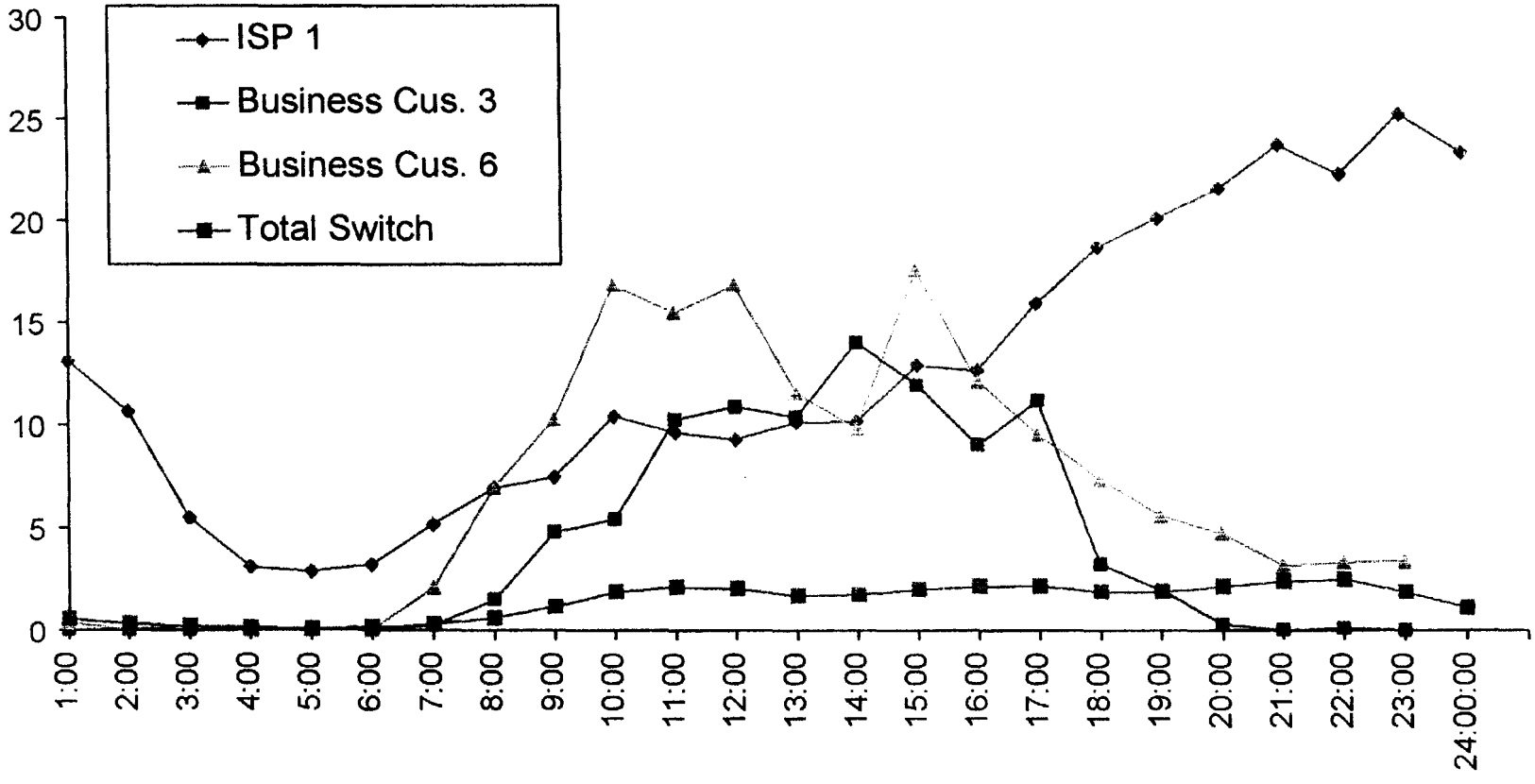


Office B 3-13-96



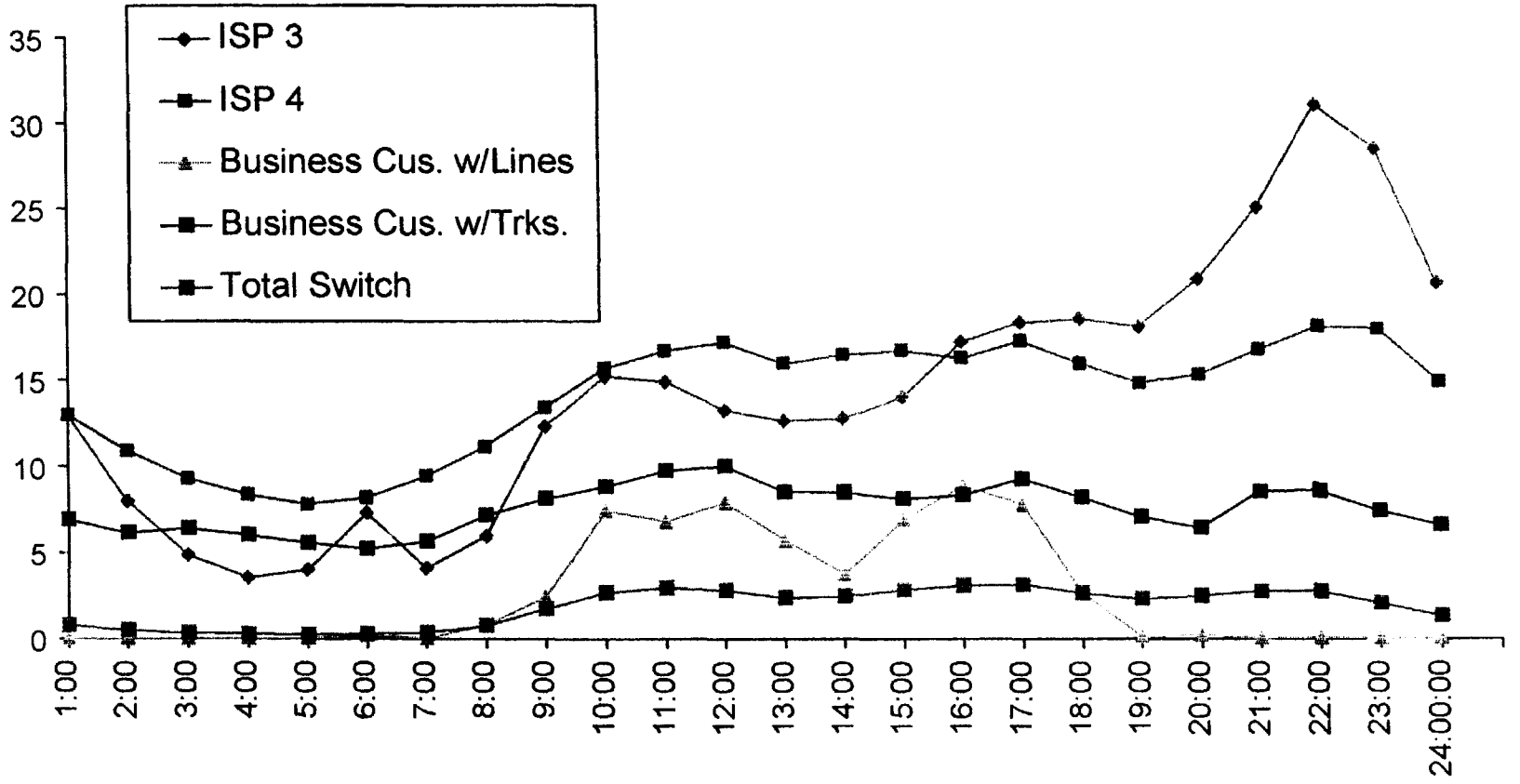
Office C 3-13-96

Busy Hour = 16:00
40% Bus., 60% Res.



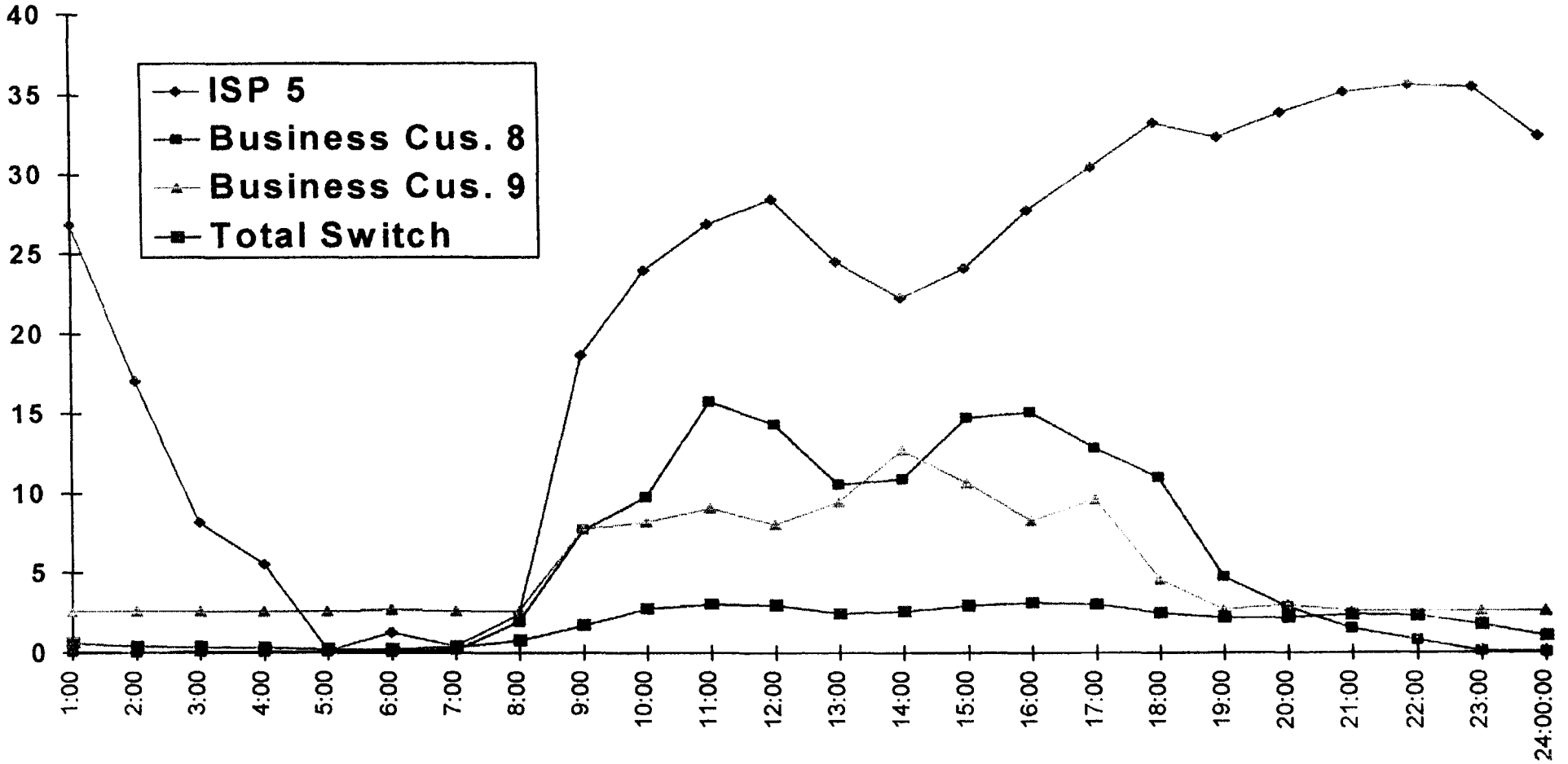
Office D 3-13-96

Busy Hour = 16:00
40% Bus., 60% Res.



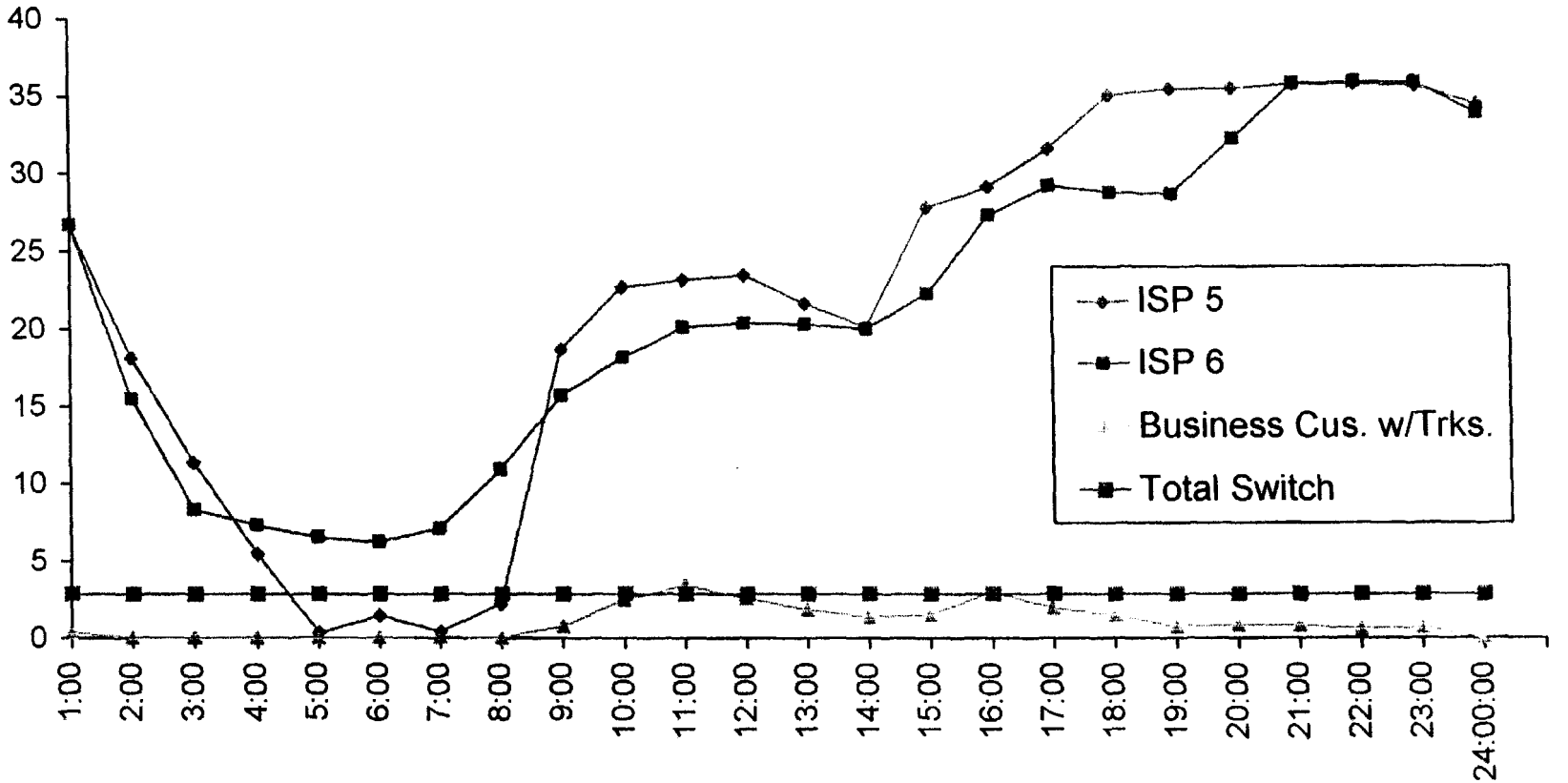
Office E - 3-13-96

Busy Hour = 16:00
50% Bus., 50% Res.



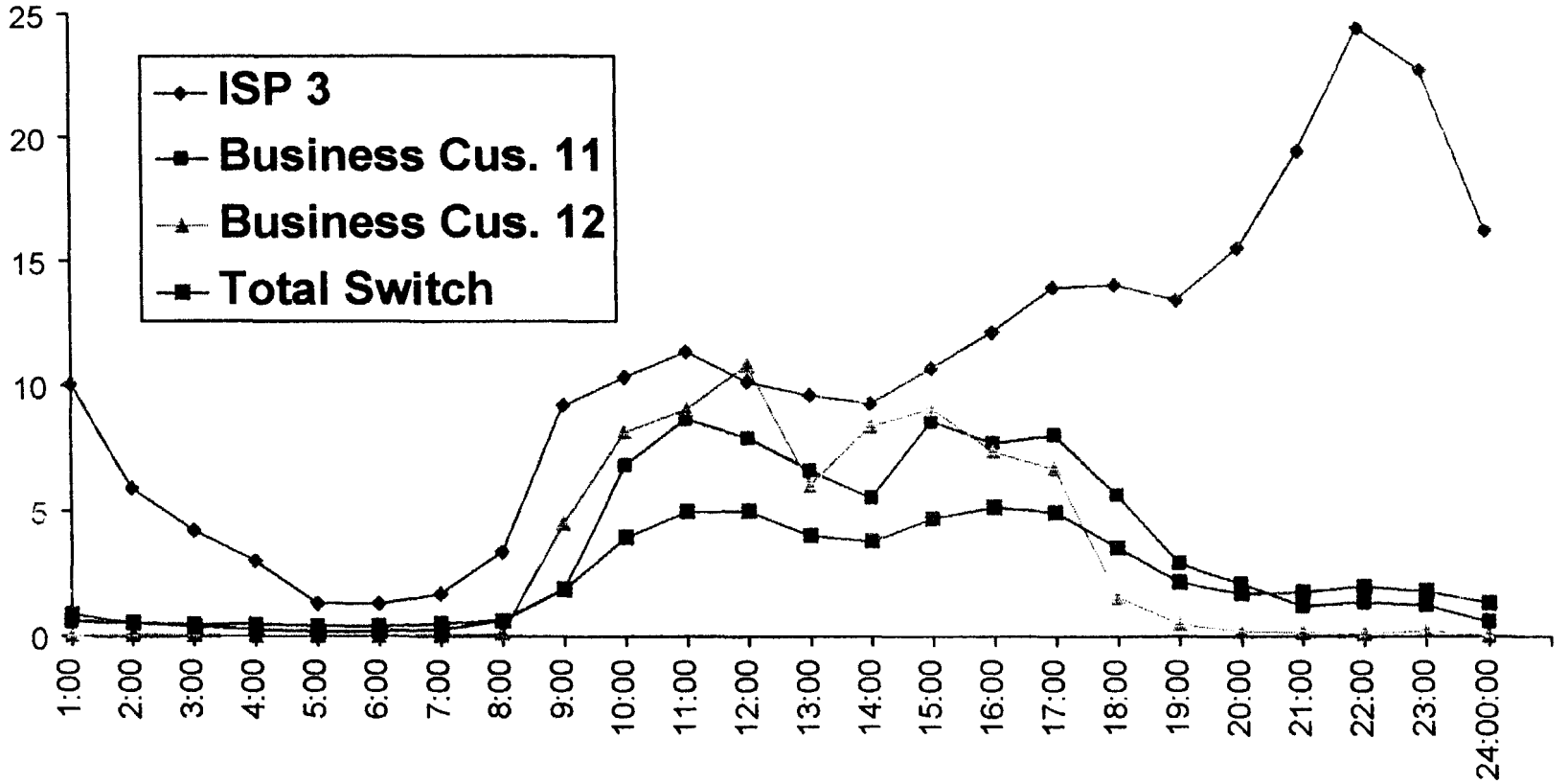
Office F 3-13-96

Busy Hour = 12:00
100% Bus., 0% Res.



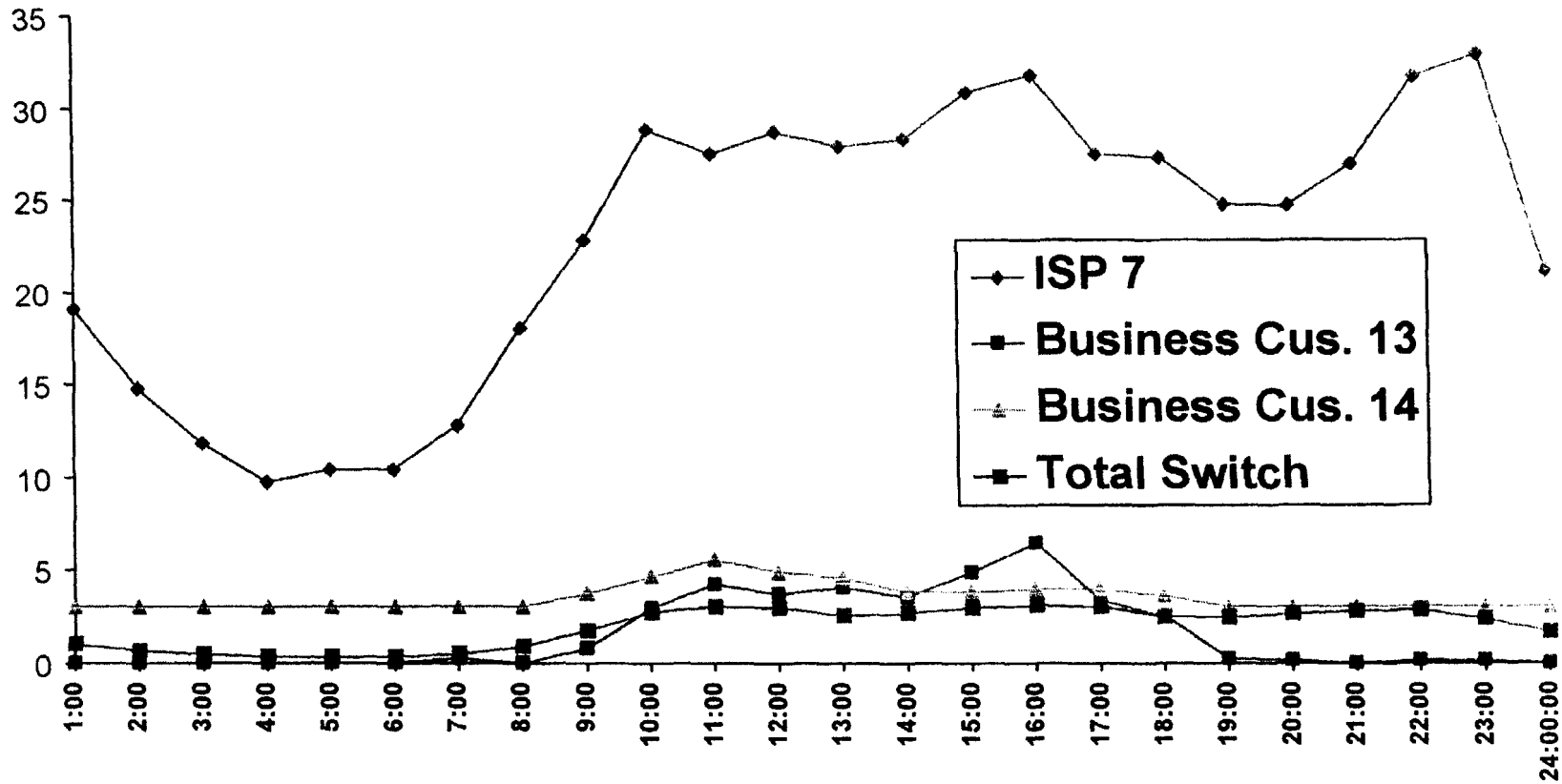
Office G 3-13-96

Busy Hour = 12:00
100% Bus., 0% Res.



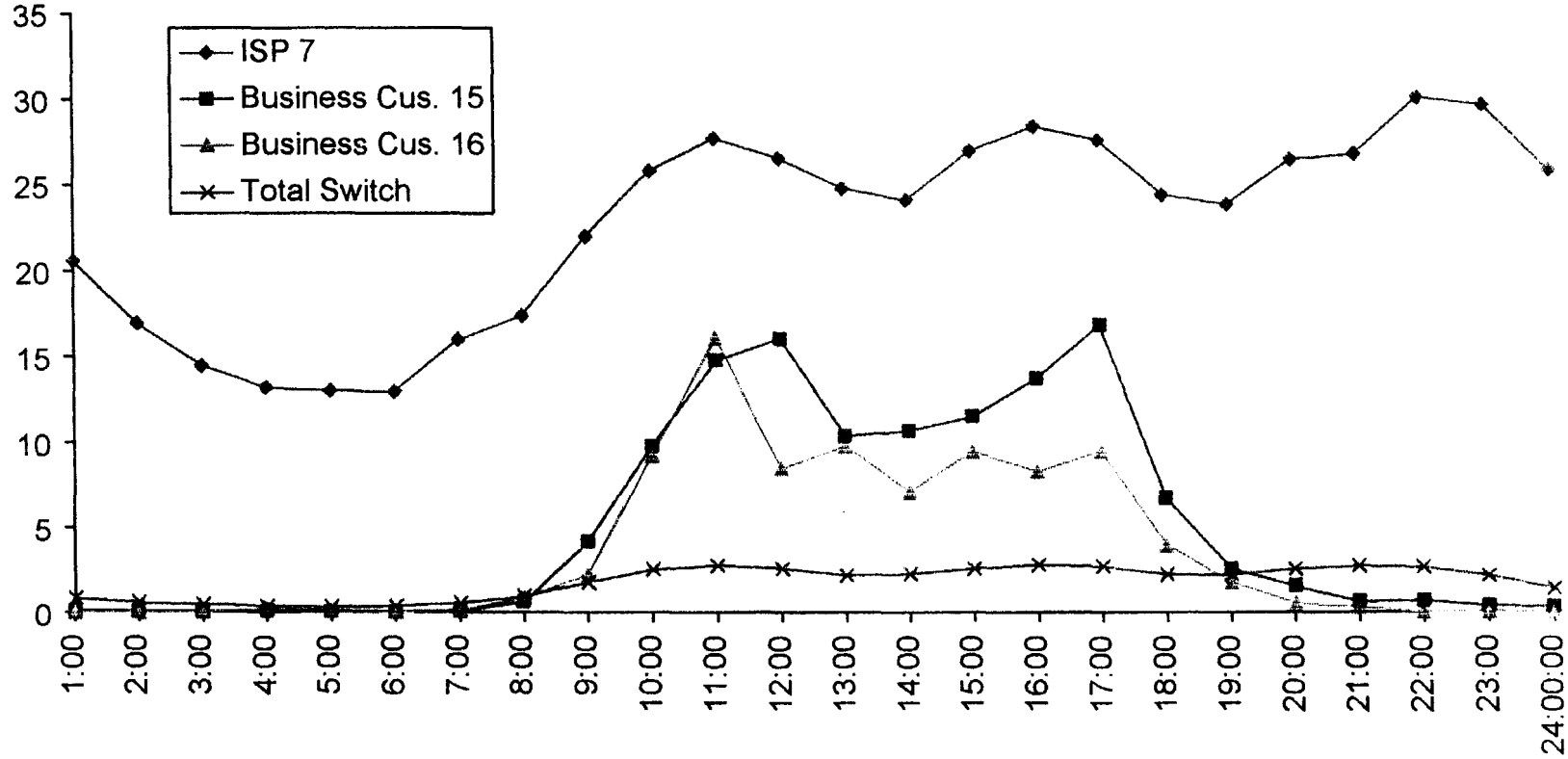
Office H 3-13-96

Busy Hour = 16:00
47% Bus., 53% Res.

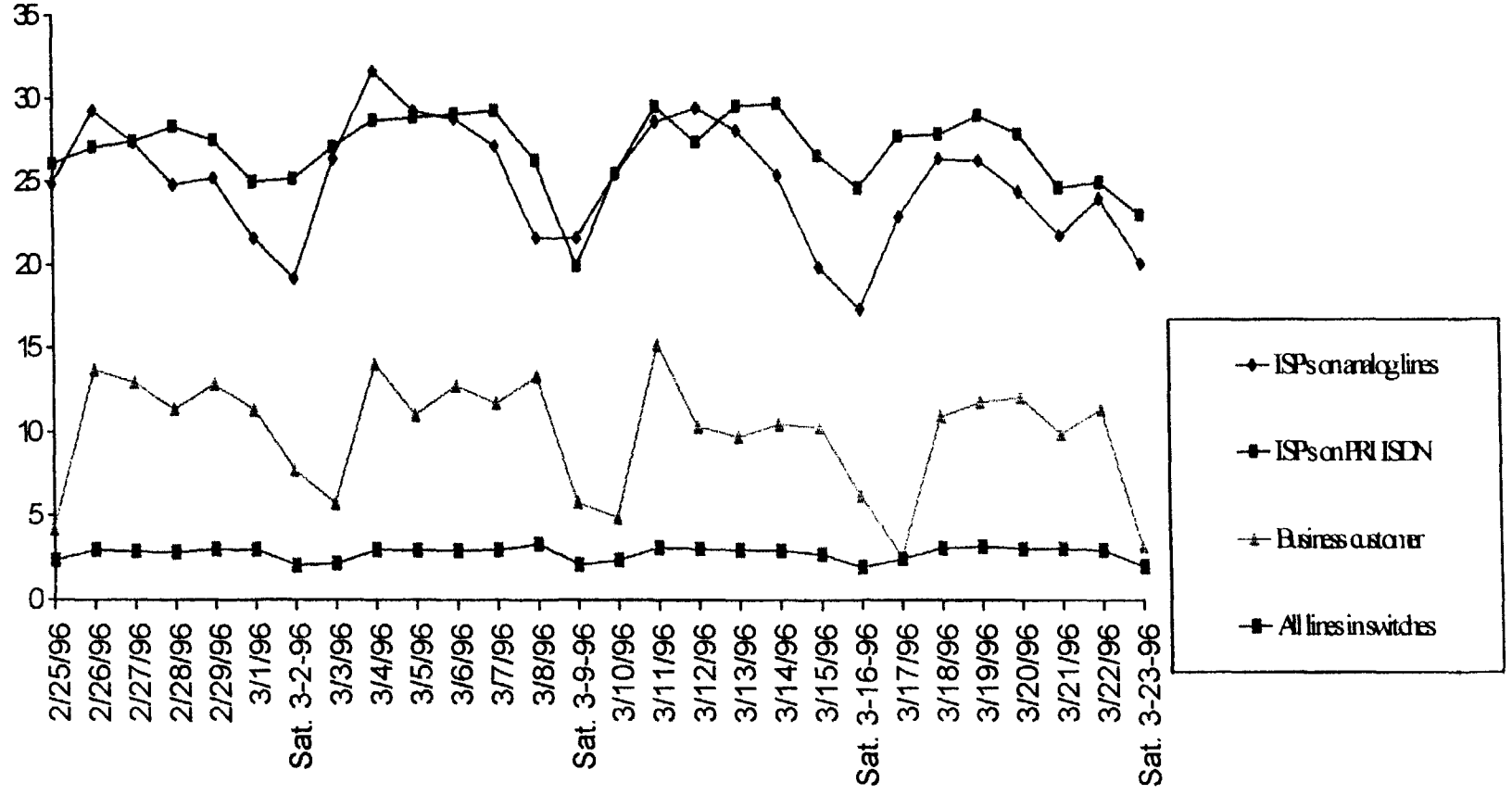


Office I 3-13-96

Busy Hour = 16:00
37% Bus., 63% Res.



COMPOSITE GRAPH FOR ALL 28 DAYS



CERTIFICATE OF SERVICE

I hereby certify that on this 29th day of January, 1997 a copy of the foregoing "Joint Comments of Bell Atlantic and NYNEX" was served on the parties on the attached list by messenger.

Tracey M. DeVaux

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